

09/891,606  
DOCKET NO. K06-135818M/TBS

8

REMARKS

Claims 1-22, 24, and 26 are all the claims presently pending in the application. Claims 1, 2, 5-6, 9, 13, 18, 20, 24, and 26 are amended to more clearly define the invention and claims 23 and 25 are canceled. Claims 1, 9, and 18 are independent.

These amendments are made only to more particularly point out the invention for the Examiner and not for narrowing the scope of the claims or for any reason related to a statutory requirement for patentability.

Applicants also note that, notwithstanding any claim amendments herein or later during prosecution, Applicants' intent is to encompass equivalents of all claim elements.

Entry of this §1.116 Amendment is proper. Since the Amendments above narrow the issues for appeal and since such features and their distinctions over the prior art of record were discussed earlier, such amendments do not raise a new issue requiring a further search and/or consideration by the Examiner. As such, entry of this Amendment is believed proper and Applicant earnestly solicits entry. No new matter has been added.

Claims 1, 3, 5, 7, 9-12, 15-19, 22-23, and 25-26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Kamiyama, et al. reference in view of the Hansen, et al. reference.

Claims 2, 4, 8, and 13-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Kamiyama, et al. reference in view of the Hansen, et al. reference and further in view of the Nakaura reference. Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the Kamiyama, et al. reference in view of the Hansen, et al. reference and in further view of the Yamada, et al. reference. Claims 20-21 and 24 stand rejected under 35 U.S.C. § 103(a) as being

09/891,606  
DOCKET NO. K06-135818M/TBS

unpatentable over the Kamiyama, et al. reference in view of the Hansen, et al. reference and in further view of the Marsh reference.

These rejections are respectfully traversed in the following discussion.

## I. THE CLAIMED INVENTION

An exemplary embodiment of the claimed invention, as defined by, for example, independent claim 1, is directed to a magnetic bearing controller for controlling a magnetic bearing. The magnetic bearing controller includes a digital processor which controls the magnetic bearing using a magnetic bearing control signal and that generates a command signal in response to outputting the magnetic bearing control signal, and a counter that starts accumulating and counting an actual work time of the magnetic bearing in response to receiving the command signal from the digital processor. The digital processor performs a comparison between the accumulated actual work time of the managed component counted by the counter and a preset maintenance time, and outputs a signal indicating start of maintenance operation of the managed component on the basis of the result of the comparison.

Conventional magnetic bearing control devices include a digital signal processor (DSP) that controls the magnetic bearing and also determines when the bearing has malfunctioned (page 1, line 22 - page 2, line 11). However, the magnetic bearings include components with a relatively short service life and, since there is no accumulation of operation time, maintenance times cannot be anticipated prior to a malfunction of these components.

By contrast, the present invention provides a magnetic bearing controller with a processor

09/891,606  
DOCKET NO. K06-135818M/TBS

that not only controls the magnetic bearing but also compares the accumulated actual work time with a preset maintenance time. In this manner, the present invention enables maintenance procedures to be more accurately anticipated which in turn can reduce down-time and costs associated with that down-time.

Additionally, since the processor performs both the functions of controlling the bearing and performing the comparison, additional components are not required merely for the purpose of performing a comparison.

In this manner, the actual work time is based upon the time of operation of the magnetic bearing which is much more closely related to the actual time of operation, rather than upon the time when the controller receives power which might include time in which the magnetic bearing is not receiving a magnetic bearing control signal and, therefore, the magnetic bearing is not operating.

## II. THE 35 U.S.C. § 112, SECOND PARAGRAPH REJECTION

Under the heading "Claim Rejections - 35 USC § 112" the Examiner indicates that "the objection to claims 1-19 is withdrawn." This statement appears to be in response to Applicants' traversal of the Examiner's previous rejection under 35 U.S.C. § 112, second paragraph that claims 1-19 are indefinite. In other words, the Examiner appears to have withdrawn the rejection of claim 1-19 under 35 U.S.C. § 112, second paragraph.

The Examiner then makes the statement that "[t]he Examiner assumes that the magnetic bearing current control signal is the magnetic bearing control signal of (sic) set forth in the

09/891,606  
DOCKET NO. K06-135818M/TBS

claims, as there seems to be no other magnetic bearing control signal to provide antecedent basis for the rejected claimed language."

In other words, the Examiner appears to agree that claims 1-19 satisfy the requirements of 35 U.S.C. § 112.

However, the Examiner then asserts that "Appropriate correction is required."

In view of the Examiner's withdrawal of the "objection" (rejection) of claims 1-19 and acknowledgment that the specification provides antecedent basis for the claimed invention, Applicants respectfully submit that "Appropriate correction is" not "required."

Should Examiner Tamai continue to contend that "Appropriate correction is required" Applicants respectfully request that the Examiner specifically point out the deficiencies in the claims to provide the Applicants with the opportunity to address the Examiner's concerns.

### III. THE PRIOR ART REJECTIONS

#### A. The Kamiyama et al. reference in view of the Hansen et al. reference

Regarding the rejection of claims 1, 3, 5, 7, 9-12, 15-19, 22-23, and 25-26, the Examiner alleges that the Hansen et al. reference would have been combined with the Kamiyama et al. reference to form the claimed invention.

Even assuming arguendo that one of ordinary skill in the art would have been motivated to combine these references, the combination would not teach or suggest each and every element of the claimed invention.

None of the applied references teaches or suggests the features of the claimed invention

09/891,606  
DOCKET NO. K06-135818M/TBS

including a digital processor which controls a magnetic bearing using a magnetic bearing control signal and that generates a command signal in response to outputting the magnetic bearing control signal in combination with a counter that starts accumulating and counting an actual work time of a magnetic bearing in response to receiving a command signal from a digital processor.

The Examiner admits that the Kamiyama et al. reference does not teach or suggest a counter.

The Hansen et al. reference does not remedy the deficiencies of the Kamiyama et al.

reference.

Rather, the Hansen et al. reference discloses a programmable maintenance timer system 10 that receives a "system run" signal from the centrifugal water chilling system 12 via line 14 (col. 3, lines 53 - 58). A computing device 32 counts a pulse signal that is based upon the "system run" signal as received via a divider network 40 and an opto-isolator 42 to determine a total elapsed operating hours. (Col. 3, lines 57 - 67). All subsequent operations and calculations of the periodic maintenance system are based upon this total elapsed operating hours which, in turn, is based upon the "system run" signal from the water chilling system 12.

Therefore, the Hansen et al. reference does not even teach or suggest a controller at all, let alone receiving anything at all from a controller, let alone a command signal, or a command signal that is generated by the controller in response to a control signal.

Further, as explained previously, the Hansen et al. reference suffers from the same problems that are solved by the present invention.

As explained above, conventional magnetic bearing control devices did not monitor the

09/891,606  
DOCKET NO. K06-135818M/TBS

actual work time because the counting that was conventionally performed was only based upon when a power source was turned on and not based upon a control signal, let alone when that control signal was sent to the magnetic bearing. Thus, these conventional systems were not able to determine whether the magnetic bearing was actually working. Rather, these conventional system were only able to determine whether power was supplied to the magnetic bearing control device.

Indeed, the Hansen et al. reference does not even teach or suggest a control system. Therefore, the Hansen et al. reference is not capable of determining when components in the chilling system are actually operating based upon a control signal at all, let alone a command signal from a controller in response to a control signal. Rather, the Hansen et al. reference merely describes the ability to determine when power is applied to the chilling system.

Thus, the Hansen et al. reference suffers from the same problems that are solved by the present invention.

Further, Applicants submit, however, that these references would not have been combined.

Applicants submit that one of ordinary skill in the art would readily recognize that the remote control system that is disclosed by the Kamiyama et al. reference is completely different from the maintenance system that is disclosed by the Hansen et al. reference.

Indeed, modifying the remote control system that is disclosed by the Kamiyama et al. reference as suggested by the Examiner would completely change the principal of operation. The Kamiyama et al. reference discloses a remote control system having a principal of operation that

09/891,606  
DOCKET NO. K06-135818M/TBS

is completely different from the maintenance system that is disclosed by the Hansen et al. reference.

As M.P.E.P. § 2143.01 states:

*"If the proposed modification or combination of the prior art would change the principal of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious."*

Since the Examiner's alleged modification would change the principal of operation of the remote control system into the completely different and unrelated maintenance system principal of operation, one of ordinary skill in the art would not have combined the references.

Applicants also submit that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different matters and problems.

The Kamiyama et al. reference is directed to the problem of "grasping the operating state of a machine main body by using an information processing means installed in a remote place, and to enable adjustment of a control means." (PROBLEM TO BE SOLVED).

In stark contrast, the Hansen et al. reference is directed to providing "a programmable maintenance timer system which could notify service personnel when servicing is required for each specific installation." (Col. 1, lines 32-35).

09/891,606  
DOCKET NO. K06-135818M/TBS

15

One of ordinary skill in the art who was concerned with receiving operating information and controlling a machine remotely as the Kamiyama et al. reference is concerned with addressing would not have referred to the Hansen et al. reference to solve this problem (and vice-versa) because the Hansen et al. reference is directed to the completely different problem of providing a programmable maintenance timer system. Thus, the references would not have been combined.

Therefore, the Examiner is respectfully requested to withdraw the rejection of claims 1, 3, 5, 7, 9-12, 15-19, 22-23, and 25-26.

**B. The Kamiyama et al. reference in view of the Hansen et al. reference and in further view of the Nakaura reference**

Regarding the rejection of claims 2, 4, 8, and 13-14, the Examiner alleges that the Hansen et al. reference would have been combined with the Kamiyama et al. reference and further alleges that the Nakaura reference would have been combined with a combination of the Kamiyama et al. reference and the Hansen et al. reference to form the claimed invention. Applicants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicants submit that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different matters and problems.

09/891,606  
DOCKET NO. K06-135818M/TBS

As explained above, the Kamiyama et al. reference and the Hansen references are directed to completely different matters and problems and, therefore, one of ordinary skill in the art would not have referred to any one of those references when trying to address the problems that are addressed by the other one of those references.

Further, in stark contrast to the Kamiyama et al. reference and the Hansen reference, the Nakaura reference is directed to matters and problems which are completely different from the matters and problems addressed by the Kamiyama et al. reference and the Hansen reference.

The Nakaura reference is concerned with prohibiting "to drive magnetic bearings and motors when a battery is in a poor condition" (PURPOSE).

One of ordinary skill in the art who was concerned with receiving operating information and controlling a machine remotely as the Kamiyama et al. reference is concerned with addressing or who was concerned with the problem of providing a programmable maintenance timer system as the Hansen et al. reference is concerned with solving would not have referred to the Nakaura reference because the Nakaura reference is directed to the completely different problem of prohibiting driving of magnetic bearings and motors when a battery is in a poor condition. Thus, these references would not have been combined.

Further, Applicants submit that the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged by the Examiner.

The Examiner alleges that the "Nakamura (sic) teaches that the bearing control

09/891,606  
DOCKET NO. K06-135818M/TBS

circuit include (sic) a signal that prevents activation of the bearings in a poor condition."

However, the Examiner conveniently overlooks (or ignores) that the Nakaura reference does not teach or suggest "bearings in a poor condition." (Emphasis added). Rather, the Nakaura reference discloses when "a battery is in a poor condition" (emphasis added, PURPOSE).

Indeed, the Nakaura reference explains that it determines whether a battery is in a poor condition "by measuring battery voltage after the battery has been discharged for a specified time when a power supply for a drive device is turned on, and thereby detecting that the battery is in a poor condition." (Id.).

Therefore, the Examiner's allegation that the Nakaura reference discloses preventing activation when the bearings are in a poor condition is false and, therefore, clearly does not provide any basis for a prima facie of obviousness (see citation to Webster's Dictionary above regarding the definition of "basis" or "based on").

Moreover, even assuming arguendo that one of ordinary skill in the art would have been motivated to combine these references, the combination would not teach or suggest each and every element of the claimed invention.

As explained above, neither the Kamiyama et al. reference nor the Hansen et al. reference teaches or suggests the features of the claimed invention including a digital processor which controls a magnetic bearing using a magnetic bearing control signal and that generates a command signal in response to outputting the magnetic bearing control signal in combination with a counter that starts accumulating and counting an actual work

09/891,606  
DOCKET NO. K06-135818M/TBS

18

time of a magnetic bearing in response to receiving a command signal from a digital processor.

The Nakaura reference does not remedy these deficiencies.

Indeed, the Examiner does not allege that the Nakaura reference remedies these deficiencies.

Rather, the Nakaura reference is only concerned with prohibiting driving of magnetic bearings and motors when a battery is in a poor condition.

Therefore, the Examiner is respectfully requested to withdraw the rejection of claims 2, 4, 8, and 13-14.

**C. The Kamiyama et al. reference in view of the Hansen et al. reference and in further view of the Yamada et al. reference**

Regarding the rejection of claim 6, the Examiner alleges that the Hansen et al. reference would have been combined with the Kamiyama et al. reference and further alleges that the Yamada et al. reference would have been combined with a combination of the Kamiyama et al. reference and the Hansen et al. reference to form the claimed invention. Applicants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicants submit that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different matters and

09/891,606  
DOCKET NO. K06-135818M/TBS

19

problems.

As explained above, the Kamiyama et al. reference and the Hansen references are directed to completely different matters and problems and, therefore, one of ordinary skill in the art would not have referred to any one of those references when trying to address the problems that are addressed by the other one of those references.

Further, in stark contrast to the Kamiyama et al. reference and the Hansen reference, the Yamada et al. reference is directed to matters and problems which are completely different from the matters and problems addressed by the Kamiyama et al. reference and the Hansen reference.

The Yamada et al. reference is concerned with monitoring operations that are carried out using visual display terminals so that a user can be accurately prompted to rest and avoid physical problems. (Col. 1, line 7 - col. 2, line 23).

One of ordinary skill in the art who was concerned with receiving operating information and controlling a machine remotely as the Kamiyama et al. reference is concerned with addressing or who was concerned with the problem of providing a programmable maintenance timer system as the Hansen et al. reference is concerned with solving would not have referred to the Yamada et al. reference because the Yamada et al. reference is directed to the completely different problem of monitoring operations that are carried out using visual display terminals so that a user can be accurately prompted to rest and avoid physical problems. Thus, these references would not have been combined.

Moreover, even assuming arguendo that one of ordinary skill in the art would

09/891,606  
DOCKET NO. K06-135818M/TBS

20

have been motivated to combine these references, the combination would not teach or suggest each and every element of the claimed invention.

As explained above, neither the Kamiyama et al. reference nor the Hansen et al. reference teaches or suggests the features of the claimed invention including a digital processor which controls a magnetic bearing using a magnetic bearing control signal and that generates a command signal in response to outputting the magnetic bearing control signal in combination with a counter that starts accumulating and counting an actual work time of a magnetic bearing in response to receiving a command signal from a digital processor.

The Yamada et al. reference does not remedy these deficiencies.

Indeed, the Examiner does not allege that the Yamada et al. reference remedies these deficiencies.

Rather, the Yamada et al. reference is only concerned with monitoring operations that are carried out using visual display terminals so that a user can be accurately prompted to rest and avoid physical problems.

Therefore, the Examiner is respectfully requested to withdraw the rejection of claim 6.

**D. The Kamiyama et al. reference in view of the Hansen et al. reference and in further view of the Marsh reference**

Regarding the rejection of claims 20-21 and 24, the Examiner alleges that the

09/891,606  
DOCKET NO. K06-135818M/TBS

21

Hansen et al. reference would have been combined with the Kamiyama et al. reference and further alleges that the Marsh reference would have been combined with a combination of the Kamiyama et al. reference and the Hansen et al. reference to form the claimed invention.

Applicants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicants submit that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different matters and problems.

As explained above, the Kamiyama et al. reference and the Hansen references are directed to completely different and unrelated matters and problems and, therefore, one of ordinary skill in the art would not have referred to any one of those references when trying to address the problems that are addressed by the other one of those references.

Further, in stark contrast to the Kamiyama et al. reference and the Hansen reference, the Marsh reference is directed to matters and problems which are completely different from the matters and problems addressed by the Kamiyama et al. reference and the Hansen reference.

The Marsh reference is concerned with enabling a data logger to continue to log data after a memory capacity is exhausted by compressing the data that was logged at a fine time resolution into a coarse time resolution and then continuing to log data at the

09/891,606  
DOCKET NO. K06-135818M/TBS

coarse time resolution (col. 1, lines 23-34).

One of ordinary skill in the art who was concerned with receiving operating information and controlling a machine remotely as the Kamiyama et al. reference is concerned with addressing or who was concerned with the problem of providing a programmable maintenance timer system as the Hansen et al. reference is concerned with solving would not have referred to the Marsh reference because the Marsh reference is directed to the completely different and unrelated problem of a memory of a data logger being filled to capacity. Thus, these references would not have been combined.

Moreover, even assuming arguendo that one of ordinary skill in the art would have been motivated to combine these references, the combination would not teach or suggest each and every element of the claimed invention.

As explained above, neither the Kamiyama et al. reference nor the Hansen et al. reference teaches or suggests the features of the claimed invention including a digital processor which controls a magnetic bearing using a magnetic bearing control signal and that generates a command signal in response to outputting the magnetic bearing control signal in combination with a counter that starts accumulating and counting an actual work time of a magnetic bearing in response to receiving a command signal from a digital processor.

The Marsh reference does not remedy these deficiencies.

Indeed, the Examiner does not allege that the Marsh reference remedies these deficiencies.

09/891,606  
DOCKET NO. K06-135818M/TBS

23

The Examiner acknowledges that neither the Kamiyama et al. reference nor the Hansen et al. reference teach or suggest "the DSP outing an instruction to the counter to count the actual work time of the magnetic bearing."

The Examiner then merely alleges that the Marsh reference "teaches the equivalence of the DSP having an (sic) separate counter requiring input and output, and the DSP being an internal counter." The fact that the Marsh reference teaches that the counter 44 may be incorporated into the microprocessor 32 has absolutely nothing to do with the claimed features.

The Marsh reference does not teach or suggest the features of the invention including a digital processor which controls a magnetic bearing using a magnetic bearing control signal and that generates a command signal in response to outputting the magnetic bearing control signal in combination with a counter that starts accumulating and counting an actual work time of a magnetic bearing in response to receiving a command signal from a digital processor.

Indeed, the microprocessor 32 that is disclosed by the Marsh reference does not control anything at all, let alone generate a command signal in response to outputting a magnetic bearing control signal.

Further, the Marsh reference clearly does not teach or suggest a counter that starts accumulating and counting an actual work time of a magnetic bearing in response to receiving a command signal from a digital processor.

Rather, the only communications between the microprocessor 32 and the counter

09/891,606  
DOCKET NO. K06-135818M/TBS

24

44 that is disclosed by the Marsh reference is the transfer of the contents of the counter 44 to the memory 46 and to clear the counter 44 so that it can thereafter accumulate data during the next data logging period. (Col. 7, lines 13-18).

The Marsh reference clearly does not teach or suggest a counter that starts accumulating and counting an actual work time of a magnetic bearing in response to receiving a command signal from a digital processor. Rather, the counter 44 constantly accumulates the output from the latch 38 and does not have to be commanded to start counting.

The Marsh reference does not remedy the deficiencies of the Kamiyama et al. reference and the Hansen et al. reference. Therefore, the Examiner is respectfully requested to withdraw the rejection of claims 20-21 and 24.

#### IV. FORMAL MATTERS AND CONCLUSION

The Office Action objects to the drawings. In particular, the Examiner alleges that "the counter based upon the magnetic bearing control signal from the DSP" must be shown or the feature canceled from the claims.

However, contrary to the Examiner's allegations, the claims do not recite a "counter based upon the the magnetic bearing control signal from the DSP."

Rather, the claims recite "a counter for accumulating and counting an actual work time of a designated managed component based upon said magnetic bearing control signal." That counter is clearly illustrated in Figure 1 with reference numeral 14 and is

09/891,606  
DOCKET NO. K06-135818M/TBS

25

labeled with the word "COUNTER."

This COUNTER 14, as clearly explained in the specification at, for example, page 19, lines 1 - 9, receives an instruction to start counting from the DSP 15 which provides that instruction to the counter when the DSP outputs a drive signal to the fan. In other words, the counter starts counting based upon the drive signal. In this manner, the counter 14 accumulates and counts the actual work time based upon the fan drive signal.

The description with respect to the fan is exemplary only and is equally applicable to control of the magnetic bearing using the magnetic bearing control signal. Therefore, the counter 14 accumulates and counts the actual work time based upon the magnetic bearing control signal.

Additionally, as very clearly explained in the specification at, for example, page 21, lines 17-24, the counter may be incorporated into the DSP, and, therefore, the counter 14 may be omitted.

The Examiner notes that the magnetic bearing current control signal is shown input to the D/A converter 13 from the DSP 15, "with no connection showing the counter 14 being based upon the magnetic bearing current control signal."

Contrary to the Examiner's allegation, Figure 1 clearly shows a connection between the DSP 15 and the counter 14. This illustration in combination with the description in the specification at, for example, page 19, lines 1-9, very clearly explain that the counter 14 receives an instruction from the DSP 15 to start counting and that the DSP sends that instruction to the counter 14 when the DSP 15 outputs the magnetic

09/891,606  
DOCKET NO. K06-135818M/TBS

26

bearing control signal.

Therefore, the drawings clearly illustrate a connection between the DSP 15 and the counter 14 through which the "counter for accumulating and counting an actual work time of a designated managed component based upon said magnetic bearing control signal" as recited by the claims.

Applicants respectfully request withdrawal of this objection.

In view of the foregoing amendments and remarks, Applicant respectfully submits that claims 1-22, 24, and 26, all the claims presently pending in the Application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the Application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

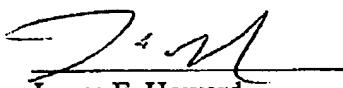
09/891,606  
DOCKET NO. K06-135818M/TBS

27

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 6/2/05



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**CERTIFICATION OF FACSIMILE TRANSMISSION**

I hereby certify that I am filing this Amendment Under 37 C.F.R. §1.116 by facsimile with the United States Patent and Trademark Office to Examiner Karl I. Tamai, Group Art Unit 2834 at fax number (703) 872-9306 this 2nd day of June 2005.



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